

AMENDMENTS TO THE CLAIMS:

1. (Original) An apparatus for measuring an amount of oil in a flow of fluid, the apparatus comprising:

a housing having an interior passage configured to have a flow of fluid pass therethrough, the housing having a receiving end coupled with an output of a source of the flow of fluid and an output end coupled with a fluid destination;

a magnetic source disposed inside the interior passage, the magnetic source being positioned such that a magnetic field producible by the magnetic source is configured to induce an electric current in a conductive portion of the flow of fluid as the flow of fluid passes from the receiving end of the housing to the output end of the housing; and

a detector disposed inside the interior passage between the magnetic source and the output end of the housing, the detector being configured to respond to the electric current induced in the conductive portion of the flow of fluid and generate a first signal representative of an amount of oil the flow of fluid.

2. (Original) The apparatus of Claim 1, wherein the housing includes a first end coupled with an outlet of a source of the flow of fluid and a second end.

3. (Original) The apparatus of Claim 2, wherein the first and second ends of the housing include flanges such that the flanges are coupleable with flanged pipe sections.

4. (Original) The apparatus of Claim 1, wherein the housing includes one of a steel pipe, an iron pipe, a copper pipe, an opaque PVC pipe, a translucent PVC pipe, or a clear PVC pipe.

5. (Original) The apparatus of Claim 1, further comprising an analog-to-digital converting circuit configured to convert the first signal into a first digital signal.

46020

CUSTOMER NUMBER

- 2 -

BLACK LOWE & GRAHAM™

701 Fifth Avenue, Suite 4800

PAGE 5/24 * RCVD AT 5/16/2005 4:33:21 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-1/3 * DNIS:8729306 * CSID:2063813301 * DURATION (mm:ss):08:20

6. (Original) The apparatus of Claim 5, further comprising an interface configured to communicate the first digital signal.

7. (Original) The apparatus of Claim 6, wherein the interface includes an RS-232 interface.

8. (Original) The apparatus of Claim 6, further comprising a first telemetry module configured to receive the first digital signal from the interface and to communicate the first digital signal to a data collection device.

9. (Original) The apparatus of Claim 5, further comprising a computing module configured to receive the first digital signal and compute a relative amount of oil in the flow of fluid, the computing module being further configured to generate a second signal indicative of the relative amount of oil in the flow of fluid.

10. (Currently Amended) The apparatus of Claim 9, further comprising at least one a second telemetry module configured to communicate the second signal to the data collection device.

11. (Original) The apparatus of Claim 9, further comprising a flow rate sensor disposed on the interior passage of the housing, the flow rate sensor being configured to measure a total rate of the flow of fluid passing through the interior passage of the housing and to generate a third signal indicative of the total rate of flow of fluid.

12. (Original) The apparatus of Claim 11, wherein the computing module is further configured to combine the second signal with the third signal for calculating a total flow rate of oil in the flow of fluid, the computing module being further configured to generate a fourth signal indicative of the total flow rate of oil.

13. (Currently Amended) The apparatus of Claim 12, further comprising at least one a third telemetry module configured to communicate the fourth signal to the data collection device.

46020

CUSTOMER NUMBER

- 3 -

BLACK LOWE & GRAHAM 

701 Fifth Avenue, Suite 4800

PAGE 6/24 * RCVD AT 5/16/2005 4:33:21 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-1/3 * DNIS:8729306 * CSID:2063813301 * DURATION (mm:ss):08-20

14. (Original) The apparatus of Claim 12, further comprising at least one additional fluid property sensor disposed on the interior passage of the housing, the at least one additional fluid property sensor being configured to measure an additional fluid property of the flow of fluid passing through interior passage of the housing and generate a fifth signal.

15. (Original) The apparatus of Claim 14, wherein the computing module is further configured to combine the fifth signal with the fourth signal for calculating an adjusted total flow rate of oil in the flow of fluid, the computing module being further configured to generate a sixth signal indicative of the adjusted total flow rate of oil.

16. (Currently Amended) The apparatus of Claim 15, further comprising at least one a fourth telemetry module configured to communicate the adjusted amount of oil signal to the data collection device.

17. (Original) The apparatus of Claim 15, wherein the at least one additional fluid property sensor includes at least one pressure sensor configured to measure a pressure of the flow of fluid passing through the interior passage of the housing.

18. (Original) The apparatus of Claim 15, wherein the at least one additional fluid property sensor includes a density sensor configured to measure a density of the flow of fluid passing through the interior passage of the housing.

19. (Original) The apparatus of Claim 18, wherein the density sensor includes a nuclear density sensor.

20. (Original) The apparatus of Claim 15, wherein the at least one additional fluid property sensor includes a temperature sensor configured to measure a temperature of the flow of fluid passing through the interior passage of the housing.

46020

CUSTOMER NUMBER

- 4 -

ROB-1-1182DA

BLACK LOWE & GRAHAM INC

701 Fifth Avenue, Suite 4800
New York, NY 10019

21. (Original) The apparatus of Claim 2, further comprising a gas separator coupled between the first end of the housing and the source of the flow of fluid, the gas separator being configured to allow separation of gas from the flow of fluid.

22. (Original) A system for measuring an amount of oil in a flow of fluid, the system comprising:

- a housing having an interior passage configured to have a flow of fluid pass therethrough, the housing having a receiving end coupled with an output of a source of the flow of fluid and an output end coupled with a fluid destination;
- a magnetic source disposed inside the interior passage, the magnetic source being positioned such that a magnetic field producible by the magnetic source is configured to induce an electric current in a conductive portion of the flow of fluid as the flow of fluid passes from the receiving end of the housing to the output end of the housing;
- a detector disposed inside the interior passage between the magnetic source and the output end of the housing, the detector being configured to respond to the electric current induced in the conductive portion of the flow of fluid and generate a first signal representative of an amount of oil in the flow of fluid;
- an analog-to-digital converting circuit configured to convert the first signal into a first digital signal;
- a computing module configured to receive the first digital signal and compute a relative amount of oil in the flow of fluid, the computing module being further configured to generate a second signal representative of the relative amount of oil;
- and
- an interface configured to communicate the second signal.

46020

CUSTOMER NUMBER

- 5 -

BLACK LOWE & GRAHAM INC

701 Fifth Avenue, Suite 4800

23. (Original) The system of Claim 22, wherein the housing includes a first end coupled with an outlet of a source of the flow of fluid and a second end.

24. (Original) The system of Claim 23, wherein the first and second ends of the housing include flanges such that the flanges are coupleable with flanged pipe sections.

25. (Original) The system of Claim 22, wherein the housing includes one of a steel pipe, an iron pipe, a copper pipe, an opaque PVC pipe, a translucent PVC pipe, or a clear PVC pipe.

26. (Original) The system of Claim 22, wherein the interface includes an RS-232 interface.

27. (Original) The system of Claim 22, further comprising a first telemetry module configured to receive the first digital signal from the interface and to communicate the second signal to a data collection device.

28. (Original) The system of Claim 22, further comprising a flow rate sensor disposed on the interior passage of the housing, the flow rate sensor being configured to measure a total rate of the flow of fluid passing through the interior passage of the housing and to generate third signal indicative of the total rate of the flow of fluid.

29. (Original) The system of Claim 28, wherein the computing module is further configured to combine the second signal with the third signal for calculating a total flow rate of oil in the flow of fluid, the computing module being further configured to generate a fourth signal indicative of the total flow rate of oil.

30. (Currently Amended) The system of Claim 29, further comprising at least one a-second telemetry module configured to communicate the fourth signal to the data collection device.

31. (Original) The system of Claim 29, further comprising at least one additional fluid property sensor disposed on the interior passage of the housing, the at least one additional fluid

46020

CUSTOMER NUMBER

- 6 -

BLACK LOWE & GRAHAM™

701 Fifth Avenue, Suite 4800

PAGE 9/24 * RCVD AT 5/16/2005 4:33:21 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-1/3 * DMS:8729306 * CSID:2063813301 * DURATION (mm:ss):08:20

property sensor being configured to measure an additional fluid property of the flow of fluid passing through interior passage of the housing and generate a fifth signal representative of the additional fluid property.

32. (Original) The system of Claim 21, wherein the computing module is further configured to combine the fifth signal with the fourth signal for calculating an adjusted total flow rate of oil in the flow of fluid, the computing module being further configured to generate a sixth signal representative of the adjusted total flow rate of oil.

33. (Currently Amended) The system of Claim 22, further comprising at least one a third telemetry module configured to communicate the sixth signal to the data collection device.

34. (Original) The system of Claim 21, wherein the at least one additional fluid property sensor includes at least one pressure sensor configured to measure a pressure of the flow of fluid passing through the interior passage of the housing.

35. (Original) The system of Claim 21, wherein the at least one additional fluid property sensor includes a density sensor configured to measure a density of the flow of fluid passing through the interior passage of the housing.

36. (Currently Amended) The system of Claim 35 25, wherein the density sensor includes a nuclear density sensor.

37. (Original) The system of Claim 21, wherein the at least one additional fluid property sensor includes a temperature sensor configured to measure a temperature of the flow of fluid passing through the interior passage of the housing.

46020

CUSTOMER NUMBER

- 7 -

BLACK LOWE & GRAHAM™

701 Fifth Avenue, Suite 4800

PAGE 10/24 * RCVD AT 5/16/2005 4:33:21 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-1/3 * DNIS:8729306 * CSID:2063813301 * DURATION (mm:ss):08:20

38. (Original) The system of Claim 23, further comprising a gas separator coupled between the first end of the housing and the source of the flow of fluid, the gas separator being configured to allow separation of gas from the flow of fluid.

39. (Original) A system for measuring an amount of oil in a flow of fluid, the system comprising:

- a housing having an interior passage configured to have a flow of fluid pass therethrough, the housing having a receiving end coupled with an output of a source of the flow of fluid and an output end coupled with a fluid destination;
- a magnetic source disposed inside the interior passage, the magnetic source being positioned such that a magnetic field producible by the magnetic source is configured to induce an electric current in a conductive portion of the flow of fluid as the flow of fluid passes from the receiving end of the housing to the output end of the housing;
- a detector disposed inside the interior passage between the magnetic source and the output end of the housing, the detector being configured to respond to the electric current induced in the conductive portion of the flow of fluid and generate a first signal representative of an amount of oil in the flow of fluid.;
- a flow rate sensor disposed on the interior passage of the housing, the flow rate sensor being configured to measure a total rate of the flow of fluid passing through the interior passage of the housing and to generate a second signal representative of the total rate of the flow of fluid;
- an analog-to-digital converting circuit configured to convert the first signal into a first digital signal;
- a computing module configured to receive the first digital signal and compute a relative amount of oil in the flow of fluid, the computing module being further

46020

CUSTOMER NUMBER

- 8 -

BLACK LOWE & GRAHAM™

701 Fifth Avenue, Suite 4800

configured to generate a third signal representative of the relative amount of oil, the computing module being further configured to combine the second signal and the third signal for calculating a total flow rate of oil in the flow of fluid, the computing module being further configured to generate a fourth signal representative of the total flow rate of oil; and
an interface configured to communicate the fourth digital signal.

40. (Currently Amended) The system of Claim 39 29, wherein the housing includes a first end coupled with an outlet of a source of the flow of fluid and a second end.

41. (Original) The system of Claim 40, wherein the first and second ends of the housing include flanges such that the flanges are coupleable with flanged pipe sections.

42. (Currently Amended) The system of Claim 39 29, wherein the housing includes one of a steel pipe, an iron pipe, a copper pipe, an opaque PVC pipe, a translucent PVC pipe, or a clear PVC pipe.

43. (Currently Amended) The system of Claim 39 29, wherein the interface includes an RS-232 interface.

44. (Currently Amended) The system of Claim 39 29, further comprising a first telemetry module configured to communicate the fourth signal to a data collection device.

45. (Currently Amended) The system of Claim 39 29, further comprising at least one additional fluid property sensor disposed on the interior passage of the housing, the at least one additional fluid property sensor being configured to measure an additional fluid property of the flow of fluid passing through interior passage of the housing and generate a fifth signal representative of the fluid property.

46020

CUSTOMER NUMBER

- 9 -

BLACK LOWE & GRAHAM™

701 Fifth Avenue, Suite 4800

BOB-1-1186GROA

PAGE 12/24 * RCVD AT 5/16/2005 4:33:21 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-1/3 * DNI:8729306 * CSID:2063813301 * DURATION (mm:ss):08-20

46. (Original) The system of Claim 45, wherein the computing module is further configured to combine the fifth signal with the fourth signal for calculating an adjusted total flow rate of oil in the flow of fluid, the computing module being further configured to generate a sixth signal representative of the adjusted total flow rate of oil.

47. (Currently Amended) The system of Claim 46, further comprising at least one a-second telemetry module configured to communicate the sixth signal to the data collection device.

48. (Original) The system of Claim 45, wherein the at least one additional fluid property sensor includes at least one pressure sensor configured to measure a pressure of the flow of fluid passing through the interior passage of the housing.

49. (Original) The system of Claim 45, wherein the at least one additional fluid property sensor includes a density sensor configured to measure a density of the flow of fluid passing through the interior passage of the housing.

50. (Original) The system of Claim 49, wherein the density sensor includes a nuclear density sensor.

51. (Original) The system of Claim 45, wherein the at least one additional fluid property sensor includes a temperature sensor configured to measure a temperature of the flow of fluid passing through the interior passage of the housing.

52. (Currently Amended) The system of Claim 39 29, further comprising a gas separator coupled between the first end of the housing and the source of the flow of fluid, the gas separator being configured to allow separation of gas from the flow of fluid.

53. (Original) A method for measuring an amount of oil in a flow of fluid, the apparatus comprising:

46020

CUSTOMER NUMBER

- 10 -

BLACK LOWE & GRAHAM INC

701 Fifth Avenue, Suite 4800

BNEI-I-1186R0A

PAGE 13/24 *RCVD AT 5/16/2005 4:33:21 PM [Eastern Daylight Time]* SVR:USPTO-EFXRF-1/3 *DNIS:8729306 *CSID:2063813301 *DURATION (mm:ss):08:20

passing a flow of fluid from a source of fluid through a housing;
generating a magnetic field in the flow of fluid passing through the housing to induce
an electric current in a conductive portion of the flow of fluid;
measuring the current induced in the conductive portion of the flow of fluid;
calculating a relative amount of oil in the flow of fluid based on the current induced
in the conductive portion of the flow of fluid; and
generating a first signal representative of a relative amount of oil in the flow of fluid.

54. (Original) The method of Claim 53, further comprising communicating the first signal to
a data collection device.

55 (Original) The method of Claim 53, further comprising measuring a rate of flow of fluid
through the housing.

56. (Original) The method of Claim 55, further comprising calculating a total flow rate of oil
in the flow of fluid by combining the rate of flow of fluid with the relative amount of oil in the
flow of fluid and generating a second signal representative of the total flow rate of oil.

57. (Original) The method of Claim 56, further comprising communicating the second signal
to the data collection device.

58. (Original) The method of Claim 56, further comprising measuring at least one additional
fluid property of the flow of fluid passing through the housing.

59. (Original) The method of Claim 58, further comprising calculating an adjusted total flow
rate of oil in the flow of fluid by combining the total flow rate of oil in the flow of fluid with the
additional property of the flow of fluid and generating a third signal.

46020

CUSTOMER NUMBER

- 11 -

R011-111650A

BLACK LOWE & GRAHAM™

701 Fifth Avenue, Suite 4800

PAGE 14/24 * RCVD AT 5/16/2005 4:33:21 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-1/3 * DMS:8729306 * CSID:2063813301 * DURATION (mm:ss):08:20

60. (Original) The method of Claim 59, further comprising communicating the third signal to the data collection device.

61. (Original) The method of Claim 58, wherein the at least one additional fluid property includes fluid pressure.

62. (Original) The method of Claim 58, wherein the at least one additional fluid property includes fluid density.

63. (Original) The method of Claim 58, wherein the at least one additional fluid property includes fluid temperature.

64. (Original) The method of Claim 53, further comprising separating gas from the flow of fluid before directing the flow of fluid from the source of fluid through the housing.

65. (Original) A method for measuring an amount of oil in a flow of fluid, the apparatus comprising:

passing a flow of fluid from a source of fluid through a housing;
generating a magnetic field in the flow of fluid passing through the housing to induce an electric current in a conductive portion of the flow of fluid;
measuring the current induced in the conductive portion of the flow of fluid;
measuring a rate of flow of fluid through the housing;
calculating a relative amount of oil in the flow of fluid based on the current induced in the conductive portion of the flow of fluid;
calculating a total flow rate of oil in the flow of fluid by combining the rate of flow of fluid with the relative amount of oil in the flow of fluid; and
generating a first signal representative of the total flow rate of oil.

46020

CUSTOMER NUMBER

- 12 -

BLACK LOWE & GRAHAM™

701 Fifth Avenue, Suite 4800

PAGE 15/24 * RCVD AT 5/16/2005 4:33:21 PM (Eastern Daylight Time) * SVR:USPTO-EFXRF-1/3 * DNI:8729306 * CSID:2063813301 * DURATION (mm:ss):08:20

66. (Original) The method of Claim 65, further comprising communicating the first signal to a data collection device.

67. (Original) The method of Claim 65, further comprising measuring at least one additional fluid property of the flow of fluid passing through the housing.

68. (Original) The method of Claim 67, further comprising calculating an adjusted total flow rate of oil in the flow of fluid by combining the total flow rate of oil in the flow of fluid with the additional property of the flow of fluid and generating a second signal.

69. (Original) The method of Claim 68, further comprising communicating the second signal to the data collection device.

70. (Original) The method of Claim 67, wherein the at least one additional fluid property includes fluid pressure.

71. (Original) The method of Claim 67, wherein the at least one additional fluid property includes fluid density.

72. (Original) The method of Claim 67, wherein the at least one additional fluid property includes fluid temperature.

73. (Original) The method of Claim 67, further comprising communicating the adjusted total flow rate of oil in the flow of fluid to the data collection device.

74. (Original) The method of Claim 65, further comprising separating gas from the flow of fluid before directing the flow of fluid from the source of fluid through the housing.

46020

CUSTOMER NUMBER

- 13 -

DOE-1.112620A

BLACK LOWE & GRAHAM™

701 Fifth Avenue, Suite 4800

PAGE 16/24 * RCV'D AT 5/16/2005 4:33:21 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-1/3 * DNI:8729306 * CSID:2063813301 * DURATION (mm:ss):08:20